DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20350-2000

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IN REPLY REFER TO

OPNAVINST 4100.6B
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OPNAV INSTRUCTION 4100.6B

From: Chief of Naval Operations

Subj: HEATING OR POWER PLANT FUEL SELECTION CRITERIA

Ref: (a) OPNAVINST 11300.6A

Encl: (1) Heating or Power Plant Fuel Selection Criteria

1. Purpose. To provide guidance concerning the selection and vulnerability of fuels for shore facilities including specific criteria for providing utility services and/or selecting energy sources for naval heating or power plants. This is a major revision of the basic instruction and should be reviewed in its entirety.

2. Cancellation. OPNAVINST 4100.6A.

3. Background. Enclosure (1) provides guidelines for fuels to be used in planning, design, and operation of new and existing shore facility heating or power plants. The basic policy for naval heating and power plants is one of ensuring that: (1) the primary fuel source used in any heating system has the lowest life cycle cost, (2) the heating system has multi-fuel capability, and (3) for large plants, it has been designed with the capability of being converted to burn solid fuels and being secured during the non-heating season. Reference (a) implements procedures which will enhance the security of utilities at naval activities.

4. Applicability. All commands operating heating, power, and industrial boiler plants on federally controlled property including government owned-contractor operated, and contractor owned-contractor operated plants.

5. Responsibilities/Authority

a. The Commander, Naval Facilities Engineering Command (COMNAVFACENGCOM) shall:

(1) Provide guidance on policy and technical matters.

(2) Grant approval or disapproval to requests for waivers to the fuel selection and storage policies for naval heating and power plants prescribed in this instruction. Requests for waivers shall be based upon life cycle economics and an assessment of the vulnerability effect on the mission of the activity as outlined in reference (a). They shall be routed to COMNAVFACENGCOM via the geographic Engineering Field Division.

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HEATING OR POWER PLANT FUEL SELECTION CRITERIA

1. GENERAL

a. Facilities shall be connected to base-wide heat distribution systems only when it has been determined to be life cycle cost effective to do so or when analysis has shown that mission reliability/vulnerability would be enhanced from connection to a central system. If there is a heating distribution system, it shall be secured, in whole or in part, whenever possible during the non-heating season to assure maximum efficiency. The following criteria for power plant fuel selection and fuel vulnerability apply to central and to individual facility heating and power boilers of the sizes indicated in the specific paragraphs. In all cases, the fuel selection shall be based upon the life cycle cost analysis. Consideration shall be given to the vulnerability to interruptions in service of the fuel selected and the level of risk associated with those vulnerabilities.

b. All naval heating and power plants must be designed, operated, maintained, and monitored to conform to applicable environmental standards. In addition, installation contingency plans should include a fuel conversion capability detailing the mechanical systems alterations and changes in operation and maintenance required to use alternative fuels.

c. When planning the construction of a central heating or power plant, coordination is required with other federal, state, and local agencies that are considering regional or district utility systems. In addition, coordination with the local utility company is required when planning a major naval plant which may affect the local utility.

2. ENERGY SELECTION FOR NAVAL HEATING AND POWER PLANTS

a. COAL

(1) NEW BOILERS. All new boilers over 100 MBTUH input and new plants over 300 MBTUH input shall be designed to be converted to burn coal and/or a solid fuel such as refuse derived fuel (RDF) or biomass, if current environmental regulations permit. A coal convertible design uses boilers increased in size

to accommodate future coal combustion but which are designed to burn oil and/or natural gas. Space should be provided for future particulate collectors, flue gas sulfur removal equipment, and solid fuel and ash handling and storage facilities. If coal convertibility severely impacts the life cycle cost effectiveness, a waiver request shall be submitted to NAVFACENGCOMHQ. Space for 90 days coal storage capacity shall be provided.

(2) REPLACEMENT BOILERS OR ADDITIONAL BOILERS for existing plants may continue to burn the present fuel. All boilers over 100 MBTUH input, installed to burn fuels other than coal, shall be designed to be coal convertible as described above.

b. FUEL OIL AND NATURAL GAS

(1) NEW OIL FIRED BOILERS, REPLACEMENTS, OR ADDITIONS (5 MBTUH UP TO 100 MBTUH). All new oil fired boilers of 5 MBTUH and up to 20 MBTUH input must be capable of burning all grades of fuel oil through No. 5. All new boilers 20 MBTUH through 100 MBTUH shall be capable of burning all grades of fuel oil through No. 6. This requirement does not apply where oil is the secondary alternate fuel in a dual fuel plant. Replacements and additional boilers shall be capable of burning the widest range of fuels presently provided in the existing facility. Fuel oil storage capability of 30 days shall be provided.

(2) NEW GAS FIRED BOILERS REPLACEMENTS, OR ADDITIONS (5 MBTUH UP TO 100 MBTUH). These boilers shall have the capability to burn oil as a secondary alternate fuel. Fuel vulnerability assessments, as outlined in reference (a), shall be considered in determining the standby fuel oil storage requirements for firm gas contracts; however, a minimum of 7 days must be provided. For interruptible natural gas contracts, a minimum of 30 days storage for fuel oil shall be provided.

c. LIQUIFIED PETROLEUM GAS (LPG)

(1) Due to uncertain availability in times of fuel shortages, use of LPG is not encouraged.

(2) Any use of LPG in a plant one MBTUH or above will require approval of NAVFACENGCOMHQ.

d. ELECTRIC HEATING. Poor energy efficiency in the generation, transmission and use of electric power, results in electric heating consuming the greatest British Thermal Units (BTU) equivalent and having the highest costs. Accordingly, in the planning of heating energy use, electricity will be given careful scrutiny to minimize its use. Cogeneration, heat pump applications, and heat recovery techniques are encouraged, where economically justified.

e. RENEWABLE ENERGY (GEOTHERMAL, SOLAR, WIND, PHOTOVOLTAIC, OCEAN THERMAL, WAVE, TIDAL, BIOMASS, REFUSE OR REFUSE DERIVED FUEL, SYNTHETIC FUEL, ETC.). The use of renewable energy sources is strongly encouraged by the Department of Defense, wherever life cycle cost effective, commercially viable, and where there is confidence in the ability of technology to provide adequate mission support reliability. Each activity using petroleum products for facilities operations purposes is encouraged to minimize such use through switching to alternative, renewable energy sources if life cycle costs warrant and federal, state or local clean air standards are not violated.

f. RECLAIMED WASTE OILS. Wherever a significant source of reclaimed waste oil exists, it should be considered as a potential fuel source for activity boilers. Care must be exercised to comply with environmental regulations and restrictions on segregating hazardous wastes and chlorinated solvents from waste oil fuels. The geographic Engineering Field Division of COMNAVFACENGCOM must be consulted prior to using waste oil as an energy source. In addition, activities should contact the nearest Naval Supply Center or Depot to determine the cost effectiveness of using fuel oil reclaimed (FOR) as an energy source. For additional information on burning waste oil refer to NAVFAC MO-911, "Utilization of Navy Generated Waste oil as Burner Fuel." (NOTAL)